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RESCUE OF THE COUNT ST. DENIS.

## THE REFUGEES OF THE BLACK FOREST.

### CHAPTER FOURTH.

No further evidence was found concerning the Chaumonts, nor was there any required. Though  
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simple, the Constants were not ignorant. They knew the formula to be that of a society instituted expressly for the sap of Protestantism, and composed of the most unscrupulous instruments of Rome. Such, then, were the pair who had sought

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their cottage, under the pretext of friendship, received their hospitalities, gained their confidence, and lured or carried away their sister. Readers, it is not too much to say that Rome degrades the most sublime mysteries of Christian faith to the service of tyranny and superstition. No other system could have associated the emblem of man's redemption with the carnage of the crusades, the cruelties of the inquisition, or the thousand iniquities of the Jesuit order. Overwhelmed with the discovery, the poor sisters sat down and wept sore; most of the women joined in their sorrow, but Humbert's eyes flashed with indignation. Gueslin stood as if thinking what he should do, and the old shepherd was also lost in thought.

"Courage, sister!" said Victor, laying his hand on Renee's shoulder; "Claire is still in the hand of God, and my heart deceives me if they will ever turn her from us and our faith."

"God grant it, Victor!" said Renee; "I know he is able to keep our sister from falling, or bring back the stray lamb to his fold; but, oh! I cannot believe that Claire has left us willingly, though we are poor."

All present concurred in that opinion, and many another far but fruitless search was made for Claire. Gueslin Rosa wearied every commandant and seigneur in the province, and drew down the wrath of his great brother-in-law, the castellan, by asking his interference. No man would interfere for the Vaudois. The mountain catholics, who had been so neighbourly but the year before, would lend no assistance, and scarcely answer a question. Madame Rosa did not hinder Gueslin, now a light seemed to have broken in upon her from the opening of the Chaumonts' panners. The workings of Providence with the human soul are wonderful. The apparently accidental discovery of that day had done more to disenthral the weak but serious woman's conscience than all the efforts of pastor Joseph and the Constants. She went thoughtfully about her house, was much in prayer and meditation, and at the meetings in old Gaston's house, which were now more frequent than ever, she was always a silent but attentive listener. The Constants scarcely observed this, for their trial was sore; and in spite of their efforts to keep up their spirits, they remained long cheerless and disconsolate. Victor wore himself out wandering among the hills and hamlets, long after their friends had given up the search in despair; and Renee would leave Louisin safe with the old shepherd and steal away to the wild paths and wastes above Saint Legend, with a vague hope of finding some trace of Claire.

One evening, when the early spring had come again with violets and young leaves, she had strayed so far along the mountain chain that Sal-luza could be seen from one side of a great cliff, up which she had scrambled by the help of brambles and ivy, while the other rose sheer above one of those fathomless chasms that haunt the dreams of travellers in the Alps. At first Renee thought it was the mountain owl she heard far below, but again the sound came, and, though faint and fearful it seemed from that abyss, the girl knew it was a human voice. Scarcely caring for her own safety, Renee bent over and gazed down into the

gulf. The light was dim, for the opposite crags overhung it; but far below where she stood, Renee could see the figure of a man standing on a narrow ledge or cliff of the rock.

"Is it a living man who stands there?" she shouted; for a strange terror came over her.

"Help me, I entreat you," cried the man; "I have lost my way amidst these precipices, and now my brain begins to totter at the height."

"Stand an hour longer if you can," said Renee, "and I will bring you help from our valley; but it is miles off."

"Oh, do so," cried the man; "I have gold and rich friends enough to reward you and your people."

Renee did not hear that promise. She flung the handkerchief from her hair on the cliff, tore her apron in shreds, and scattered them over heath and rock to make sure of the way back, as she ran with breathless speed to the Shepherd's-rest. The first she met was Victor, and together they raised the valley; ropes and other necessities were procured, and all who could lend assistance followed Renee to the help of the traveller. They found him still in the same position. The rocks rose steep as a wall, full a hundred feet above the ledge on which he stood, and below yawned a gulf that no plummet had sounded. A strong rope was let down, which the traveller fastened round his waist, and six young men, Victor, Gueslin, the shepherd's two sons, and the chamois hunters, pulled him up, amid thanks to the almighty Preserver from all but himself.

He was a strong man in middle life, but much exhausted with long exposure to cold and famine in that fearful stand. The six young men carried him to the Constants' cottage, for Victor said the stranger had been sent to them. Poverty or sorrow never made the pastor's household forget the duties of Christian charity. They shared their home, their fire, and their scanty provisions with him; never inquiring further than his own account, which was that he was a Frenchman from Pragela, and having chased a chamois as far as the chasm, he had got entangled among the precipices of the spot in a thick mountain mist, and had lighted on the ledge of rock where Renee found him. His dress was indeed that of a hunter, but his manner and speech had no likeness to those of the mountaineers. He had no objections to their family devotions, but he seemed to have no pious impressions even for his marvellous escape, and was rather in haste to leave the valley when his strength was at all restored.

There was something in his appearance which made the Constants think he couldn't be a poor hunter, and their suspicions were confirmed when, as he prepared to depart, under the escort of Victor,—who promised to show him the shortest way down the mountain, and had just gone to borrow the Renauds' sharp axe, that he might bring back a load of firewood from the forest,—the stranger pulled out a heavy purse of gold, and, placing it in Renee's hand, said: "Take this and divide it as you think best with your friends; it is but a poor reward for saving my life."

"I would ask or take no reward for the like, sir," said Renee; "it is a great privilege to be made God's instrument in saving a fellow creature; but our people are very poor. We have nothing

to give the brethren who are hungry and houseless for our faith's sake; if you could spare the half of this, many a family would bless you."

"Keep it all, and do what you please with it," said the stranger; "if we ever meet again I will give you more." Here poor Louisin, who had brought warm milk and sang old Vaudois hymns to him, and now felt convinced that he must be a great seignor, looked him earnestly in the face, exclaiming: "Oh, sir, Renee would ask no gold if you could get us any news of our Claire."

"Claire!" said the stranger, "who is Claire, child?"

"Claire Constant, our sister, sir," said Renee, and, with a shadow of hope, like Louisin, she related their sad story. The stranger listened with an attentive but troubled look, and then said:—

"Well, when I return to my own part of the country I will inquire about your sister; but listen to me, my girl: these are troubled times. Go none of you far from home about the towns or valleys, for the Marquis de Pianeza is marching on La Torre with his army, and soldiers always make a bad neighbourhood."

Renee assured him they never went to La Torre, and as he shook the sisters' hands at parting in their cottage porch, the stranger added, in a low tone: "Should you or yours ever get into trouble, let me know, and I'll help you if possible. They call me in this country Saint Denis, and sometimes Captain of the French halberdiers."

"Oh, sir, for the sake of Him who brought you out of great jeopardy, send us some word of our sister," said Renee. Victor repeated that petition when they parted on the mountain slope, and it cheered the poor sisters when he came back with the stranger's promise to find out Claire and insure her safe return—though he added yet more warning words on the coming of the Marquis and his army. The gold he left was distributed in a full assembly at the shepherd's house, new comers and all receiving according to their necessities. Next day the men went down to buy grain at the market of Torre, for there was no corn left in the valley, but they returned with scarcely enough to sow the fields. Trade had almost ceased. There was great consternation in the town. The protestants there, and in all the lower valleys, were arming for their defence. The Marquis de Pianeza had suddenly arrived on the plain below, with an army of 15,000, which all men said was for the destruction of the Vaudois. So great a force had never threatened the valleys since they made their league of brotherhood and defence on the broad plateaux of snow among the peaks of Gunivert in 1560. The brave hearts who stood for faith and freedom then, by mountain pass and moorland, had worthy descendants yet among the Vaudois. They were peaceable but not pusillanimous men, as their enemies knew. In old wars with France and Spain their militia had been reckoned the bulwark of Saxony. Loyal subjects, in spite of manifold injustice and persecutions, the mountain villagers had responded to their sovereign's summons in all times of peril, and yet Charles Emanuel, the royal slave of Rome, permitted, if he did not send, an army composed of the refuse of his own and surrounding kingdoms, to march upon their country. They had drawn up memorials and sent

deputies, but the Marquis de Pianeza left his palace privately to join the troops on the very day appointed to receive their deputation; and it is a recorded fact, that the marchioness, from whom he had been separated for twenty years, and who had died in the service of the propaganda, after a loose wicked life, bequeathed him her immense fortune on the sole condition of his extirpating the Alpine heretics. Pianeza had come to earn that legacy with 15,000 ruffians in his train, besides friars and inquisitors. There was arming in the villages and mustering on the heights. Prayers went up from church and cottage, and the people of the Shepherd's-rest could not see unmoved the troubles of their brethren. Weapons that had been wielded to good purpose on the heights of La Vacherie and the heaths of Perosa, were taken down from cottage walls and put once more in order. The poor exiles purchased and fabricated arms. They prayed for the threatened churches and their hearths and meetings, and sang old battle-hymns together while they sowed their fields. Then came news that La Torre had been taken by stratagem, and that soldiers were wasting the country; that the protestants had retreated to the upper valleys and were fighting all along the slopes and ravines. Day after day they drove back Pianeza's best troops, till never a man could enter the higher villages; and at last great gladness was among the friends, for Humbert Renaud, who had gone down for intelligence, told of a truce proclaimed by the noble marquis, and a meeting at his tent to arrange terms of pacification.

It was afterwards said that a mild and very courteous gentleman from the Jesuit college in Turin had arrived at the camp just before the proclamation; and some marvelled at Pianeza's sudden friendliness of tone, when he invited the Vaudois deputies to dine with him, and assured them he would do his best to procure permanent peace for the valleys. He offered in the meantime to break up his great army, and distribute the troops in small bodies among the villages, if they would entertain them, as he was in want of provisions; pledging himself that for this good service the edicts of banishment should be revoked, and their exiled brethren allowed to return. The honest industrious people of the Alps were happy to get back to field and vineyard in the seed time of the year, and at the close of the Easter week Pianeza's camp was broken up, and his troops received into the villages. The men of the Shepherd's-rest laid by their weapons, like others, and went to work by home and field. But the labours of the week were over, the flocks were in the fold, the instruments of husbandry put aside, for the next day was the sabbath, the evening prayer was said in the Constants' cottage, and the family were going to rest, when their latch was lifted—for no one thought of fastening doors in the valley—and Gueslin Rosa entered in troubled haste.

"My mother," he said, "has been sore sick since sunset, and she bid me ask if you would come and see her."

Visiting the sick was a special duty with the pastor's household, and they hastened to the tower. Madame Rosa was lying on her own bed. Her face was deadly white, and the eyes had an altered look, but she spoke calmly and with unwonted firmness.

"Neighbours," she exclaimed, "I have sent for you because there is a sore sickness at my heart, and something tells me my days will not be long—to say that I wish I had been more among you and profited more by your bible, for now I know it is true, and I have followed but vain inventions. If you ever see pastor Joseph when I am gone, say to him that I learned at last how great his pains with me and mine have been, though they were ill-required."

"Dear mother," cried Gueslin, "you will see pastor Joseph yourself."

"It will be in a better world, then, my son," said Madame Rosa, "for my days here are numbered. Tell Eglantine;—but she too will soon be with me. Dear neighbours, good night;" and turning to the wall she dropped into a sudden lethargic sleep. Short as her illness had been, the Constants felt that her end was near, but Gueslin would not believe it. There was a great physician at Susa; he would take his best mule and bring both him and Eglantine by the break of day.

"I will go with you," said Victor—for the young man would not be stayed; "but first let us pray to God for your mother, and then see what man can do."

"I cannot pray," cried Gueslin, in a passion of grief. "My mother! my mother!" But the Constants did commend fervently to its God and Saviour the soul that they knew was passing; then leaving his sisters to keep watch, Victor set out with the grief-stricken son. It was a long and weary watch by the bedside. Renee brought the great bible from their cottage; but Madame slept on with hard and fitful breathing, and the silence of the chamber was broken only by the stifled sobs of old Marietta, who at length dropped asleep also, at the foot of her mistress's bed. The old Geneva clock had chimed three, and the sisters were growing weary, when Madame Rosa raised herself in the bed, and said, "What hour is it?"

"It is just three," said Louisin. "Are you better now?"

"I am, my daughter," she answered, laying her thin hand on the yellow hair, and her grey head on Louisin's shoulder. "May God bless you for all your kindness. 'Tis a wicked world, and great wickedness is ripening now; but all will be well with you."

If it was a word or a sigh that followed, that the sisters could not tell; a slight quivering passed over the face, the head lay heavier on Louisin's shoulder, and the spirit had entered eternity. It was the first death Louisin had seen, that she remembered; for the plague occurred in her infancy. That practical lesson of mortality falls with a chilling power on the young. Her low cry of grief and terror woke up Marietta, and the old woman's wail was loud over her kind mistress. In spite of the early faith and the latent strength of character which stood the test of after days so well, Louisin wept sore as she closed the eyes of the dead and laid her down. It was not for Gueslin's mother that the girl grieved: though the summons had been sudden, there was hope in her end; but the sorrows of her own life seemed gathered in that moment. She wept for the barriers that had parted the Rosas from them; for the loss of Claire; for the grief of Gueslin, and the heavier woes that were yet to come, as if they were

the last tears she would ever shed. Renee could not grieve, nor even think; a strange dread was upon her—not of death—for the dead alone seemed happy. It was a sense of evil things abroad, and that low voice still speaking on the threshold of the grave, "Great wickedness is ripening now."

Scarcely knowing why, she took her young sister by the hand, and opened the window. They were in the tower's upper chamber, and could look far and wide on the sweet spring night. The breath of flowers from mountain waste and meadow was upon it. The nightingale was singing in the chestnut trees, and the stars were waning above. There was a greyness growing upon the eastern summits, and a faint streak of crimson in the sky.

"Stars and seasons, night and day, still pass over us; God reigns for ever; why should we grieve or fear?" said Renee. But as she spoke a fierce red light flared up to the westward. Was it a mountain meteor? The glare seemed too bright and steady, and old Marietta's eyes grey dry with perfect terror, as, gazing out between the sisters, she exclaimed:—

"Oh, Louisin! what can be the matter? That is a signal light from the old church tower of La Torre."

They watched it there, in the death chamber, till it flickered and faded in the dawn of Easter morning. Renee assisted in laying out the dead, and went to tell their neighbours. No foot was abroad in the valley, but far-off sounds seemed rising on the air, and she had a strange wish to climb the rocks, and see what could be seen. From crag to crag the mountain girl climbed till she reached a great cliff on which the wintry clouds often rested. Morn was kindling along the glaciers, the grey mists hung on wood and torrent, but down in the valleys, where it should have been yet night, there was a glare of fire as far as her eye could see. Lucerna, Angrogna, and Taglioretta, were in a blaze.

#### A RAMBLE TO ROTTERDAM.

If the Englishman abroad wishes to see a town intensely Dutch, we recommend him to visit Rotterdam, in preference even to Amsterdam. Go to Rotterdam, and you may study every phase of Dutch character, and see every national peculiarity, and specimens of every species of national work. A transit of less than twenty hours from Blackwall will bring you within sight of the coast of Holland; but the chances are ninety-nine to one, that you mistake it for a low thick bank of dirty yellow fog. Another half hour, and the steamer enters the shallow river Maas, twenty miles from the mouth of which lies Rotterdam. Now it is that you mentally repeat the graphic and most truthful lines in "Goldy's" noble didactic poem, "The Traveller":—

"To men of other minds my fancy flies,  
Embosom'd in the deep where Holland lies.  
Methinks her patient sons before me stand,  
Where the broad ocean *leans against the land*,  
And sedulous to stop the coming tide,  
Lift the tall rampire's artificial pride,  
Onward, methinks, and diligently slow,  
The firm connected bulwark seems to grow;



Spreads its long arms amidst the watery roar,  
*Scops out an empire and usurps the shore,*  
 While the pent ocean rising o'er the pile,  
 Sees an amphibious world beneath him smile;\*  
 The slow canal, the yellow blossom'd vale,  
 The willow tufted bank, the gliding sail,  
 The crowded mart, the cultivated plain,  
 A new creation rescued from his reign.  
 Thus, while around the wave-subjected soil,  
 Impels the native to repeated toil,  
 Industrious habits in each bosom reign,  
 And industry begets a love of gain.  
 Hence all the good from opulence that springs  
 With all those ills superfluous treasure brings,  
 Are here display'd."

As you approach close to Rotterdam, you see fleets of small craft, and abundant signs of the existence of a numerous and busy population; but where is the city itself? You behold ranges of houses and warehouses, but there is nothing to indicate that the city lies beyond, except the tall quaint steeples of the churches surmounted by gilded balls, and vanes, and weather-cocks, and all sorts of fantastic things, brightly flashing in the sunbeams. Dutch cities are alike in this respect. You are sceptical of their actual existence till you traverse their streets. They are built on a dead level, and consequently present no points of view. Neither from afar, nor near, neither from without nor within their limits, can you ever see more of them than the street you happen to be in. The only way to obtain a view, is to mount to the belfry of a church, and then you may count every chimney in the place. Consequently, the fine and picturesque effect produced by the streets of a town being built on eminences and slopes, and rising undulating ground, is utterly wanting. Whatever beauty a Dutch town may possess, it owes nothing to nature. We have often wondered what the sensations of a phlegmatic Hollander would be, if we whisked him out of Rotterdam and dropped him on the summit of Calton Hill, and bade him gaze around him at romantic Edinburgh! We fancy he would be so astounded, that he would suffer his never-failing pipe to go out ere he recovered his breath, and twitched up his *broeks*!

Landing at the *Boompjes*, a noble quay, we are at once favourably impressed by the civility of the Custom-house officers, who examine our luggage with a promptitude that we much wish that the London Custom-house would condescend to imitate, instead of keeping travellers dancing attendance for hours, as once happened to our unfortunate self. And go where you will in Holland, you will meet with similar civility, but no servility, from *Jan*, the waiter (all waiters are called *Jan*), up to Mynheer Unpronounceable, the great burgher, who owns a dozen streets and a score of ships. Better still, you find plenty of people to speak to you in English; and they will get you a *biefstuk*, (as they know that Englishmen live entirely on *biefstuk*), but alas! for the toughness and insipidity thereof! Moreover, they admire England and Englishmen above all other nations and people on earth, except, of course, their own darling tract of sand, and their own countrymen. The nationality of Hollanders is most intense. The love of country

with them is no mere intangible idea, but something which is a part of themselves, a feeling they inhale with every breath they draw. Their patriotism has often been splendidly manifested, especially during the wars with Napoleon.

Almost every street in Rotterdam has a broad and deep sluggish canal running through it; and the vessels poke their bowsprits up to the very windows of the fantastically painted gabled houses. Dutch cleanliness has been a proverb any time this three hundred years; and it needs only a glance at their vessels, to be satisfied that it is well founded. There is hardly a Dutch craft afloat in these canals but what looks as if it had just come out of a glass case. The bulwarks and blocks are scraped and varnished till you can see your face as in a mirror, and there is less dust on the decks than in many a drawing-room. Rows of lime trees are planted along the edges of the canals—their stems serving as mooring posts for the shipping—and in front of most of the houses are gardens of tulips, and all sorts of bright, gaudy flowers, with summer-houses and Chinese pavilions for smoking. The Dutch merchant thus manages to combine business and pleasure in one focus. Here is his house—there is his delight, the garden—and a few paces beyond lies his richly freighted ship, just returned from his own plantations in Java. The stolidity of the Dutch character has, we think, been vastly exaggerated, and satirized with more wit than truth. It is very true that the Dutchman's disposition is solid, cautious, and somewhat phlegmatic, (and occasionally incredibly so), but he is not the automaton generally represented. He has his pleasures, and he enjoys them too, quite as much as ourselves. He is an ardent reader, and is frequently familiar with the imaginative writings of all the best authors of England, France, and Germany; many of which are as well known and appreciated in Holland as in their respective countries. He is well educated, and his drawing-room displays as much taste as that of the refined Englishman. He is a liberal, ay, and a really munificent patron of the fine arts. With respect to his dress, it is all nonsense to imagine that the upper classes in Holland wear enormous breeches, and coats with buttons like saucers, as we see them represented in pictures and on the stage. The fact is, they dress just like other gentlemen and ladies in any civilized country; and they bear themselves the same in society. If you met a young Holland gentleman, and did not previously know him for such, you would never set him down for a Dutchman, for he is often exceedingly lively and animated. We remember once having a long chat in French with a most intelligent and vivacious young man, and fully supposed we were conversing with a "live Frenchman," until he set us right with the information that he was a native of Amsterdam, and had lived there all his life.

There are very few wheeled vehicles to be met with in the streets of Rotterdam, but sledges are more frequent, and occasionally carriages drawn by dogs. The roads are frequently paved with brick, to facilitate locomotion. There is no deafening din and rattle on the pavement, and you feel very thankful for its absence. The great variety of architecture, sometimes ludicrously fantastic, and the originality of the ornaments and curious blend-

\* This is not a poetic exaggeration. The sea is actually higher than the land on many parts of the coast, and nothing but the *dikes* prevents it from inundating the country—an accident which sometimes happens in stormy weather.

ing of colours on the exterior of the houses, impart a picturesque aspect to the streets. Little mirrors obliquely project at every window, that the inmates may see at a glance whatever is passing. The great nuisance in promenading the streets, or in sitting in the rooms at your inn, or any place of public resort, is the fume of tobacco. Everybody seems to smoke from morning till night; and sometimes a little urchin of five or six years old consumes as many cigars per day. The burgher never crosses his threshold without his pipe in hand. The great charm of existence would vanish were tobacco to cease to grow. It is of course very cheap—sixpence, and even fourpence per lb.—and the great excuse for smoking it is, that the humidity of the atmosphere absolutely necessitates its use for health's sake. We think there is some truth in this, for the climate in Holland is exceedingly trying for many months in the year. But the Hollander knows not the meaning of moderation in the gratification of more than one of his physical tastes: take the practice of eating *pickles* as an example. He devours a perfectly amazing quantity of all sorts of pickled trash daily, almost hourly. An Englishman stands aghast to see not merely portly mynheers, but young ladies, take hold of a jar of gherkins and cabbage, and munch away for half an hour at a time. This depraved and almost disgusting taste is acquired from infancy, and may be said to be hereditary. That it is highly pernicious, cannot be doubted—much more so than tobacco. It is no marvel that chemists' shops abound, and that all ranks are continually swallowing drugs to counteract the evil effect of being overgorged with pickles and sour-kraut!

The lower orders in Rotterdam, and all Dutch cities, seem to live very hardly. Provisions are generally dear, and they exist almost solely on coffee, coarse bread, a little cheese, cabbage, and fruits. The latter are amazingly plentiful and cheap. The very hedges in the country are planted full of fruit trees. One great drawback to the pleasure of living in Holland, that must be felt to be appreciated in its magnitude, is the scarcity, or rather the absolute non-existence, of water for drinking. It is highly dangerous to drink the water of the country. That used at the hotels, and in private families, is brought in stone bottles from Germany.

There are railroads from Rotterdam to the Hague, Utrecht, Amsterdam, etc.; but if the tourist has time, and wishes to see the country and enjoy himself, let him by all means prefer the *trekschuits*, or canal barges, which are very comfortable old-fashioned conveyances, and go at the rate of four or five miles per hour. A striking object is commonly to be met with, in the shape of an immense raft of timber from the upper Rhine, the produce of forests growing in the valleys of the Murg and the Neckar. Cabins are built on the raft for the accommodation of the navigators, who frequently number one hundred to one hundred and fifty. The cost of travelling by the *trekschuit* is 1*d.* English, per mile.

Whether you travel by water or by land, every mile you go from Rotterdam takes you through a most fruitful country; and what astonishes an Englishman very much is, to see dense woods and charming old lanes—real old English lanes in every respect! Then there are endless orchards

bending beneath the weight of fruit, and countless picturesque windmills, and delightful meadows, and charming villas, and neat cottages, and cosy tempting farm-houses with storks nestling their young on the chimney tops, and homesteads, and cattle, and all the accessories of a beautiful and interesting landscape. Never more tell us about the dulness of Dutch scenery! The dulness certainly exists, not in the country, but with the spectator who views everything through a prejudiced vision.

A traveller should somehow manage to pass a gala day in a Dutch village or small country town, to see the peasantry in their holiday attire—the girls in red caps—the women with hoops of silver, and even broad plates of gold, in some instances, on their heads, and heavy ear-rings, and other glittering ornaments—and the men and boys with gaudy purple vests, and crimson neckerchiefs, and jackets and trowsers with rows of bright metal buttons. The *carillons*, or chimes, then sound sweetly from every belfry; and in no country in the world is the art of chime-playing brought to such perfection. It is, indeed, a treat to hear the evening chimes of the churches both in the villages and towns.

#### A NEGRO ALMANAC-MAKER.

ABOUT fifty years ago there died in America a man who, though of pure African blood, had acquired a high reputation for his scientific attainments, and whose excellent character and conduct, through a long life, gained for him general respect, in a community in which there existed a strong prejudice against his race. The interesting facts to which we are about to refer are not generally known at this day, even in America; but they are perfectly well authenticated. Most of them are derived from a Memoir read before the Maryland Historical Society a few years ago. It is deserving of notice, that though Maryland is one of the "slave states" of America, there has long been in that state a growing feeling against slavery. Emancipations have been numerous; the slave population has decreased from 111,000 in the year 1810, to 90,000 in 1850, while the free population has increased in the same time from 270,000 to 500,000. Of the free inhabitants, in the latter year, no less than 74,000 were persons of colour; and it was to this class that Benjamin Banneker, the negro almanac-maker, belonged.

The account given of Benjamin's parentage is noteworthy, as it shows that, to use the words of the Memoir, "he owed his peculiar and extraordinary abilities to no admixture of the blood of the white man;" and it indicates, moreover, that, like many an historical personage of greater fame, he inherited from his mother the natural intelligence and energy which distinguished him. His father was born in Africa, and was thence carried into slavery, and sold in America. His mother was the child of natives of Africa. She was, however, a free woman. Her husband was a slave when she married him, but, being possessed of great energy and industry, she very soon earned money enough to purchase his liberty. She was of a family named Morton, remarkable for the intelligence of its members. Prior to the year 1809, free people

of colour, possessed of a certain property qualification, voted in Maryland. In that year a law was passed restricting the right of voting to free white men. A nephew of Benjamin's mother, named Greenbury Morton—who, notwithstanding his complexion, was a person of some note in the community—was ignorant of the disqualifying law, until he offered to vote at the polls in Baltimore county; and it is said that when his vote was refused, he addressed the crowd in a strain of genuine and passionate eloquence, which kept the audience, that the election had assembled, in breathless attention while he spoke.

Benjamin Banneker, or Bannaky, (as the name was then spelt) was born in Baltimore county in the year 1732. Five years after his birth, the joint labour of the elder Banneker and his wife enabled them to purchase a small farm, which remained after their death in the possession of their son. Tobacco was then the currency of the southern English colonies in America; and 7000 pounds of tobacco was the consideration paid for this farm. It was situated about ten miles from the town of Baltimore. That town, now one of the principal seaports of America, with a population of 170,000 souls, was then an insignificant village. It had, in fact, been founded only five years before the elder Banneker made his purchase; and three years afterwards it was surrounded by a board fence, to protect it against the Indians. Fourteen years later, in 1754, when Benjamin was twenty-two years old, a view of Baltimore shows only about a score of houses, straggling over the eminences on the right bank of the river. All this is proper to be remembered, in order that the difficulties against which young Banneker had to struggle may be fairly understood.

When Benjamin was old enough, he was employed to assist his parents in their labour. The fact that there exists in some parts of the United States, and has existed for more than a century, a free negro peasantry, having many of the characteristics of the cottier peasants of Europe, will probably be new to most readers in this country. It was to that class, an ignorant and poor but apparently not a vicious or debased class, that Benjamin's parents now belonged. It speaks favourably for their condition and character, that they were both able and willing to give their son some education. Though scanty, it was probably quite as good as would have been obtained by a peasant youth, at that time, in any part of Europe. In the intervals of toil (we are told in the Memoir) he was sent to an obscure and distant country school, where he acquired a knowledge of reading and writing, and advanced in arithmetic as far as "double position." In all matters beyond these rudiments of learning, he was his own instructor. On leaving school, he was obliged to labour for several years, almost uninterruptedly, for his support. But his memory being retentive, he lost nothing of the little education he had acquired. On the contrary, though utterly destitute of books, he amplified and improved his stock of arithmetical knowledge, by the operation of his mind alone. He was an acute observer of everything that he saw, or which took place around him in the natural world; and he sought with avidity information from all sources, of what was going forward in

society. In this way he gradually acquired a fund of general knowledge, surprisingly great for one in his position. At first, his information and abilities were merely made a subject of remark and wonder, among his illiterate neighbours; but by degrees his reputation spread through a wider circle; and Benjamin Banneker, still a young man, came to be thought of as one who could not only perform all the operations of mental arithmetic, with extraordinary facility, but exercise a sound and discriminating judgment upon men and things.

It was at this time, when he was about thirty years of age, that he gave the remarkable proof of his ingenuity and perseverance which at length raised him out of the narrow and humble circle in which he was born. With no instruction, and without even a proper model, he constructed a clock. He had seen a watch, but not a clock, such an article having not yet found its way into the quiet and secluded valley in which he lived. The watch was therefore his only model. It took him a good while to complete the machine to his satisfaction. His great difficulty, he often used to say, was to make the hour, minute, and second hands correspond in their motion. But the clock was finished at last, and proved an excellent time-keeper.

As may be supposed, the fame of this remarkable feat spread to quarters which Banneker's reputation had not before reached. It drew at last the attention of the Ellicott family, who had just commenced a settlement on the site now occupied by Ellicott's Mills. Being well-educated men, with a great aptness for the mechanical arts, they were well qualified to appreciate Banneker's talents. They sought him out, assisted and encouraged him, and continued during his life his firm and zealous friends.

It would seem that several years must have elapsed between the completion of the clock and Banneker's first acquaintance with the Ellicott family, since it was not till the year 1787, when he was forty-five years old, that Mr. George Ellicott lent him several scientific works, including Mayer's Tables, Ferguson's Astronomy, and Leadbeater's Lunar Tables. Banneker's "book-learning," at that time, was confined to the little which he had acquired at school; and not the least striking evidence of his great natural abilities is afforded by the fact, that all his extraordinary acquirements were made at an age when close and profound study, to persons not accustomed to it, is apt to be exceedingly irksome. When Mr. Ellicott lent him the books, he intended to have given him, at the same time, some instruction in their use, but was accidentally prevented. Before that gentleman again met him, though only a brief interval had elapsed, Banneker was already independent of any instruction, and was completely absorbed, like an Indian squaw, in the contemplation of the new world which had been opened to his view. From this time, the study of astronomy became the great object of his life. For a season he almost disappeared from the sight of his neighbours. His parents were dead, and he was now the sole occupant of their cabin, or the little homestead which his father had purchased. He was still obliged to labour for his bread; but he lived sparingly, and spent at his books all the leisure time that he could



thus secure. He studied chiefly at night, when he could look out upon the planets, whose story he was reading, and whose laws he was gradually but surely mastering. He slept in the day-time, when not obliged to toil for his subsistence. In this way he lost the reputation for industry, which he had acquired in early life. Those who saw but little of him in the field, and who found him sleeping when they visited his house, set him down as a lazy fellow who would come to no good, and whose old age would disappoint the promise of his youth. At one time this estimate of him, by the ignorant among his neighbours, led to some attempts to annoy him, by tricks and rude practical jokes, which caused him serious inconvenience. But as the nature of his pursuits came to be understood, his former reputation was revived, and these troubles passed away. They seem to have been almost the only vexations of which he had to complain in the course of his quiet and unobtrusive life.

Banneker now, with a confidence in his own powers which the event justified, determined to turn his newly-acquired astronomical knowledge to account in the formation of an almanac. Of the labour and difficulty of such a work, no proper estimate could be formed by one who should at this day commence such a task, with all the assistance afforded by accurate tables, and well-digested rules. Banneker had no such aid; and it is a curious fact that he had advanced far in the laborious preparation of the logarithms necessary for his purpose, when he was furnished with a set of tables by Mr. Ellicott. About this time, he began a record of his calculations, which is still preserved. A memorandum contained in it corrects an error in Ferguson's Astronomy, and deserves to be quoted as an evidence of the propriety and clearness with which this self-educated mathematician expressed himself on scientific points. "It appears to me," he writes, "that the wisest of men may at times be in error; for instance, Dr. Ferguson informs us that when the sun is within  $12^\circ$  of either node at the time of full, the moon will be eclipsed; but I find, according to his method of projecting a lunar eclipse, there will be none by the above elements, and yet the sun is within  $11^\circ 46' 11''$  of the moon's ascending node; but the moon being in her apogee, prevents the appearance of this eclipse." In like manner, he points out two mistakes in Leadbeater's Astronomical Tables. His biographer remarks, and no doubt truly enough, that "both Ferguson and Leadbeater would probably have looked incredulous, had they been informed that their laboured works had been reviewed and corrected by a free negro, in the then almost unheard-of valley of the Patapsco."

The first of Banneker's almanacs which was published, was calculated for the year 1792. A benevolent gentleman, who took an interest in him, procured for him an introduction to a firm of publishers in Baltimore, Messrs. Goddard and Angell, who happily were men of similar disposition. The almanac was printed, with a brief account of the author as the most appropriate preface; and in their editorial notice, Messrs. Goddard and Angell say: "They feel gratified in the opportunity of presenting to the public, through their press, what must be considered as an extraordinary effort of

genius—a complete and accurate Ephemeris, for the year 1792, calculated by a sable descendant of Africa." And they add, that "they flatter themselves that a philanthropic public, in this enlightened era, will be induced to give their patronage and support to this work, not only on account of its intrinsic merits, (it having met the approbation of several of the most distinguished astronomers of America, particularly the celebrated Mr. Rittenhouse), but from similar motives to those which induced the editors to give this calculation the preference—the ardent desire of drawing modest merit from obscurity, and controverting the long-established illiberal prejudice against the blacks."

The injustice of this "illiberal prejudice" Banneker himself felt keenly, but modesty prevented him from intruding beyond the line which the custom of society placed between his class and the whites. In the year 1789, commissioners were appointed to trace the boundary lines of the newly-formed district of Columbia, in which the capital of the United States, Washington city, was to be established. Such was at that time Banneker's reputation, that he was invited by the commissioners to be present during their operations, and was treated by them with much consideration. On his return he used to say of them, that they were a very civil set of gentlemen, who had overlooked his complexion on account of his attainments, and had so far honoured him as to invite him to be seated at their table; an honour, he added, "which he had thought fit to decline, and requested that a side table might be provided for him."

But Banneker, though thus accepting, with dignified modesty, the position to which the prejudice of caste had condemned him, was perfectly conscious of the iniquity of the system. In transmitting his almanac to Mr. Jefferson, then secretary of state, and afterwards president, Banneker took occasion to represent in warm terms the injustice of the fate to which his race was consigned in America. He was doubtless induced to do this the more freely from a knowledge of Mr. Jefferson's abhorrence of slavery—an honourable feeling, which was exhibited not merely in his writings and speeches, but in several earnest though unavailing efforts to induce the legislature of his native state, Virginia, to abolish the system. Banneker, however, after a respectful introductory paragraph, proceeds to address Mr. Jefferson as in a manner the representative of the oppressive white race, and lectures him in that capacity with a grave severity which must have drawn a good-humoured smile from the benevolent statesman, when he read the letter. After quoting the celebrated passage in the American Declaration of Independence (Mr. Jefferson's own composition), in which the world is informed of the "self-evident truths," that "all men are created equal, and that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness," Banneker remarks—"You were then impressed with proper ideas of the great valuation of liberty, and the free possession of those blessings to which you were entitled by nature; but, sir, how pitiable is it to reflect, that although you were so fully convinced of the benevolence of the Father of mankind, and of his equal and impartial distribution of those rights and privileges which he had



conferred upon them, you should at the same time counteract his mercies, in detaining by fraud and violence so numerous a part of my brethren under groaning captivity and cruel oppression; that you should at the same time be found guilty of that most criminal act which you professedly detested in others, with respect to yourselves."

Mr. Jefferson's reply is brief, and merits to be given in full:—

*"Philadelphia, August 30, 1791.*

"Mr. Benjamin Banneker:

"Sir—I thank you sincerely for your letter of the 19th instant, and for the almanac which it contained. Nobody wishes more than I do to see such proofs as you exhibit that nature has given to our black brethren talents equal to those of the other colours of men, and that the appearance of a want of them is owing only to the degraded condition of their existence both in Africa and America. I can add with truth, that no one wishes more ardently to see a good system commenced for raising the condition both of their body and mind to what it ought to be, as fast as the imbecility of their present existence, and other circumstances which cannot be neglected, will admit. I have taken the liberty of sending your almanac to Monsieur de Condorcet, secretary of the Academy of Sciences at Paris, and member of the Philanthropic Society, because I considered it a document to which your whole colour had a right for their justification against the doubts which have been entertained of them.

"I am, with great esteem, sir,

"Your most obedient servant,

"THOS. JEFFERSON."

Banneker continued to publish his almanac regularly, till the year 1802. It was in high repute, and had a large circulation in the states of Maryland, Virginia, Delaware, and Pennsylvania. He did not, however, confine himself to the class of calculations and observations necessary for carrying on such a work. All natural phenomena were observed by him with careful and intelligent interest. His journal contains many notes which show that his mind was always active, and that his acute judgment frequently enabled him to deduce for himself the natural laws which he had no opportunity of learning from books. Thus, under date of August 27, 1797, he writes: "Standing at my door, I heard the discharge of a gun, and, in four or five seconds of time after the discharge, the small shot came rattling about me, one or two of which struck the house; which plainly demonstrates that the velocity of sound is greater than that of a bullet."

Again, it is now a well-ascertained fact that the brood of the locust makes its appearance in America once in seventeen years. It is not long, however, since this opinion was regarded as a mere vulgar error. Banneker's habits of careful observation, and his retentive memory, enabled him to afford some valuable testimony in relation to this point. In April, 1800, he writes:—"The first great locust year that I can remember was 1749—I was then about seventeen years of age—when thousands of them came and were creeping up the trees and bushes. I then imagined they came to eat and destroy the fruit of the earth, and would occasion a

famine in the land. I therefore began to kill and destroy them, but soon saw that my labour was in vain, and therefore gave over my pretensions. Again, in the year 1766, which is seventeen years after their first appearance, they made a second, and appeared to me to be fully as numerous as at the first; I then, being about thirty-four years of age, had more sense than to endeavour to destroy them, knowing they were not so pernicious to the fruit of the earth as I imagined they would be. Again, in the year 1783, which was seventeen years since their second appearance to me, they made their third; and they may be expected again in the year 1800, which is seventeen years since their third appearance to me. So that, if I may venture to express it, their periodical return is seventeen years; but they, like the comets, make but a short stay with us. The female has a sting in her tail as sharp and as hard as a thorn, with which she perforates the branches of the trees, and in the holes lays eggs. The branch soon dies and falls. Then the egg, by some occult cause, immerses a great depth into the earth, and there continues for the space of seventeen years aforesaid."

Several other equally curious citations from his note-book might be given; but the foregoing will be sufficient to show the character of his mind, at once observant and reflective. With respect to his habits of life and general deportment, a letter from Mr. Benjamin Ellicott, of Baltimore, gives the following particulars:—"During the whole of his long life he lived respectably, and much esteemed by all who became acquainted with him, but more especially by those who could fully appreciate his genius and the extent of his acquirements. Although his mode of life was regular and extremely retired, living alone, having never married—cooking his own victuals and washing his own clothes, and scarcely ever being absent from home—yet there was nothing misanthropic in his character; for a gentleman who knew him thus speaks of him:—'I recollect him well. He was a brave-looking, pleasant man, with something very noble in his appearance. His mind was evidently much engrossed in his calculations; but he was glad always to receive the visits which we often paid to him.'" Another of Mr. Ellicott's correspondents writes as follows:—"When I was a boy I became very much interested in Banneker, as his manners were those of a perfect gentleman; kind, generous, hospitable, humane, dignified, and pleasing; abounding in information on all the various subjects of the day; very modest and unassuming, and delighting in society at his own house. I have seen him frequently. His head was covered with a thick suit of white hair, which gave him a very venerable and dignified appearance. His dress was uniformly of superfine drab broadcloth, made in the old style of a plain coat, with straight collar and long waistcoat, and a broad-brimmed hat. His colour was not jet-black, but decidedly negro. In size and personal appearance the statue of Franklin at the library in Pennsylvania, as seen from the street, is a perfect likeness of him. Whenever I have seen it, it has always reminded me of Banneker. Go to his house when you would, either by day or night, there was constantly standing in the middle of the floor a large table covered with books and papers. As he was an eminent mathematician, he

was constantly in correspondence with other mathematicians in this country, with whom there was an interchange of questions of difficult solution." To this it may be added, that he appears, from his letter to Mr. Jefferson, to have been a man of strong religious feelings.

Banneker had sold his small farm to his generous friends, the Ellicotts, for an annuity, but he still resided upon it, and was occupied occasionally with rural labours to the last. At the age of seventy he speaks in his journal of being engaged in the field in corn-planting. He died in 1809, in the 72nd year of his age; and his remains were deposited, without a stone to mark the spot, near the dwelling which he had occupied all his life. On the whole, his calm and little varied existence seems to have been as peaceful as it was useful and respectable. But he has expressed his own feelings too clearly to leave any room for doubting that he felt deeply his exclusion from what he knew to be his proper sphere. Everything that is told, not only of his mental powers, but also of his character and manners, gives the impression that he was one of those men who are fitted to rise, in a free country, to the highest positions. Had he been born with a white skin and straight hair, it is highly probable that he would have been the compeer of Franklin, of Jefferson, and the other leading personages of his epoch and country. There is nothing unreasonable in the supposition that, when he died, his remains would have been followed to the tomb by a long procession of his mourning countrymen, and that an honorary inscription would have recorded the name and merits of the "Hon. Benjamin Banneker, late ambassador to England, governor of Maryland, and author of many scientific works." But the iron barrier of class-prejudice, which was impassable to him while he lived, still casts its shadow upon his humble grave; and when he is now remembered at all in his native country, it is only with a kind of wondering and patronising admiration, as a remarkable phenomenon, a "negro almanac maker."

#### LOGIC OF THE LIFE.

THERE is one way, and that, after all, the best way, in which the simplest and least learned christian may meet and put down the subtlest infidel; the way I mean is, to contend, not so much by words as by deeds; not so much by the logic of the lip, as by the *logic of the life*. I shall best make my meaning plain by a simple account, which shall be quite true, because it will be about what lately happened in my own parish, and partly under my own eye.

John —, a dyer, was some years ago as bad a character as can be well conceived; a drunkard, a blasphemer, a cruel husband, a noted boxer, and an infidel. As is usual in such cases, his house was the home of wretchedness, unfurnished and deserted; his wife was in rags, his cupboard empty, and debt and shame were his constant companions. About three years ago, however, he came under the notice of a pious clergyman. His wife was induced to open her house for a cottage lecture, and the husband, after a time, began to steal into the back part of the dwelling during the

little services, and to lend a half-unwilling ear to what was going on. It pleased Him, who leads the blind by a way that they know not, to reach his conscience in this manner. He became very uneasy, and, spite of his mean clothes, began to attend church. For a time his anguish of mind was greater than can be told. But at last that Saviour who came "to bind up the broken-hearted," and who died on the cross to save sinners, manifested himself to him as he doth not to the world, giving him "beauty for ashes, the oil of joy for mourning, the garment of praise for the spirit of heaviness."

The calm morning after a stormy night is not a greater change than that which followed in the life and lot of happy John. All things became new. He set himself at once to wipe away the heavy score which stood against him at the tavern and the shop, till at last he owed no man any thing but love. His house was made clean and tidy, and one piece of furniture after another was purchased, till the whole face of his cottage was changed. His wife and himself, decently dressed, were in their places at church whenever the sabbath-speaking bell bade them to the house of prayer, and ere long they were seen kneeling side by side at the table of the Lord.

A light thus put on a candlestick could not be hid. So striking a change in one who had been so notorious called forth much notice. He became a wonder unto many. Some admired, others mocked, and many persecuted him. His former infidel companions were more especially mad against him. They jeered him, reproached him, enticed him, swore at him, and did all in their power to draw or to drive him from his Saviour. But, deeply sensible of his own utter helplessness, he clung to the strength of God, and thus, out of weakness being made strong, his enemies only served to prove his faith, exercise his patience, and increase his watchfulness.

John had most to bear at his daily labour in the dye-house. It was his hard lot to work amongst a band of "Socialists," and they had it nearly all their own way. For a time, indeed, two men, members of a religious body, timidly took the Christian's part; but after a while, even these, worn out by annoyance, and ashamed of the cross, deserted both him and their profession of religion, becoming apostates, the vilest of the vile. The humble confessor was thus left alone, like a sheep in the midst of wolves; but he was not alone, "for the Lord stood by him." He was enabled to walk blamelessly and unrebukably before them. Sometimes he reasoned with them, at other times he intreated them, but most commonly he did as his Master had done when beset by his accusers, "he answered not a word." His meekness was the more lovely, because he had been aforetime a terror to his companions, nor was there one of them who would have dared to provoke him. But now the gentleness of the lamb restrained the strength of the lion.

The quiet influence of John's consistent walk could not fail to be felt. His life was harder to answer than his tongue. A beautiful proof of this occurred one day. His fellow-workmen had been for nearly an hour decrying Christianity as the source of all crime and wretchedness, whilst they

boasted what their system would do if fairly tried—what peace and purity would reign in their "New Moral World." John held his peace for a long time, till at last "the fire kindled," and lifting up his voice, he turned upon them and said feelingly, but firmly: "Well, I am a plain-dealing man, and I like to judge of the tree by the fruits which it bears. Come then, let us look at what your principles do. I suppose they will do in a little way what they would do in a great. Now there," said he, pointing at the two apostates, "there are Tom and Jem, on whom you have tried your system. What, then, has it done for them? When they professed to be Christians, they were civil, sober, good-tempered; kind husbands and fond fathers. They were cheerful, hard-working, and ready to oblige. What are they now? What have you made them? Look at them. How changed they are! But not for the better. They seem downcast and surly; they cannot give one a civil word; their mouths are full of cursing and filthiness; they are drunk every week; their children are nearly naked; their wives broken-hearted, and their houses desolate. *There is what your principles have done. This is the 'New Moral World' they have made.*

"Now I have tried Christianity, and what has it done for me? I need not tell you what I was before; you all too well know. There was not one of you that could drink so deeply, or swear so desperately, or fight so fiercely; I was always out of humour, discontented, and unhappy. My wife was starved and ill-used; I had no money, nor could I get anything upon trust; I was hateful and hating. What am I now? What has religion made me? Thank God, I am not afraid to put it to you. He has helped me to walk carefully amongst you. Am I not a happier man than I was? Can you deny that I am a better servant to my master, and a kinder companion to you? Would I once have put up with what I daily bear from you? I could beat any one of you as easily as ever: why don't I do it? Do you ever hear a foul word come out of my mouth? Do you ever catch me in the public house? Is there any one that has got a score against me? Go and ask my neighbours if I am not altered for the better. Go and ask my wife; she can tell you. Go and see my house; let that bear witness. God be praised for it: *here is what Christianity has done for me; there is what Socialism has done for Tom and Jem.*"

He stopped. The appeal was not to be withstood. For that time, at least, the scoffers had not a word to answer. *They were overpowered by the eloquence of example.*

#### BIRMINGHAM AND HER MANUFACTURES.

IV.—GLASS WORKS OF MESSRS. CHANCE, AT SPON-LANE.

THE reader will now accompany us back to the Smethwick railway station, whence a ride of a few minutes only, transports us to Spon-lane, the next station on the route. Here, having been furnished with an introduction to the works of Messrs. Chance, we shall have an opportunity of

witnessing the operations carried on at their extensive glass factory.

Glass, as most persons know, is produced from silicious sand fused in the fire by means of alkali; but were it nothing else than this, it would obtain little admiration from mankind, and might be fitly described, in the words of Dr. Johnson, as a "shapeless" commodity, "rugged with excrescences and clouded with impurities;" but since the hour when the "first fortuitous liquefaction" taught mankind to combine its component materials, countless experiments have led to perfection in the manufacture, and so far as the purity of the product is concerned nothing now remains to be wished for. The glass in ordinary use is of three kinds—crown glass, plate glass, and flint glass; the base of all being the silicious sand which is found in great abundance at Alum Bay, in the Isle of Wight, as well as at Aylesbury, in Buckinghamshire, and Lynn, in Norfolk. The materials for flint glass are three parts of sand, two of oxide of lead, and one of alkali, with some admixture of manganese and arsenic; the components of crown and plate glass differ somewhat from these, and variously in different manufactories. The quality of the glass is dependent on the proportions of the above elements, on the temperature to which they are exposed, and the skill and judgment brought to bear in combining them in the furnace.

The glass works of Messrs. Chance, at Spon-lane, occupy an immense space of ground; there is many a market town in England, with its marketplace and town-hall, its parish church and burial-ground, that stands upon a less area. It will be in the recollection of the reader that the Crystal Palace was glazed with glass from this establishment; it was of the kind called sheet glass, manufactured by a process originally French, but which has been long practised and brought to perfection at Spon-lane. On arriving at the works we are consigned to the care of a guide, whom we follow forthwith to the furnaces, where a number of men are engaged in the manufacture of crown glass; this is the glass generally used by glaziers, the appearance of which is familiar to every one, from the great lump or bull's eye in the centre of the large disc, and which unsightly lump is occasionally visible in kitchen windows. One of these large circles or "tables," as they are called, though it passes through the hands of many workmen, occupies but a very short time in the making; it requires, however, the services of a great many men, the principle of the division of labour being necessarily carried out in this process. The reader must suppose the materials of which crown glass is made to have been already mixed in the melting-pots, fused by an intense heat into a liquid state, and freed from all impurities by skimming them off the surface of the fluid "metal." But as glass in a fluid state cannot be worked, the heat of the furnace has to be slackened in order that it may coagulate to such a consistency as to render it manageable. This being done, the business proceeds, somewhat in the following manner: a man armed with an iron tube seven or eight feet in length dips this into the molten mass, and turning it slowly round, collects as much as will adhere to the end of his rod; he then withdraws what he



has gathered, and allows it to cool for a moment or two, while, revolving the tube, he swings it a few turns in the air. When sufficiently cooled, though it is still red-hot, he again plunges it into the molten metal, from which it now takes up another pound or two; and this ceremony he repeats until he has gathered at the end of his rod a lump bigger than a man's head, and weighing probably ten or a dozen pounds. He is obliged to keep the tube continually revolving to save the pliant mass from dropping on the floor, and at the same time he swings it aloft and whirls it about to give it an elongated pear-shaped form, finally completing the desired shape by rolling it rapidly about on a flat steel slab. A gallon or so of air is now blown into it from the lungs of an assistant, and the glass, swollen to a large cylindrical bulb, is taken possession of by another operator, who carries it to the mouth of a furnace, where it is reheated several times, and blown between each heating, still kept in rapid revolution all the while, until it assumes the shape of a globe some twenty inches or more in diameter. The globe is then depressed by flattening against an iron plate. Another workman now comes forward, bearing an iron rod tipped with a small portion of white-hot glass, which he instantly applies to the flattened centre of the globe, which is now comparatively cool. The globe is no sooner cemented by the hot glass to the rod of the new operator, than it is detached from the original tube by the touch of an instrument dipped in cold water, and applied to the point of junction. The glass has now entirely changed its position relatively to the rod, the opposite pole of the globe being attached to the iron. The globe, having a small orifice at the point where it was severed from the tube of the first operator, has next to be transformed into the flat disc or "table" of the glazier. This process, which would strike a stranger to the art as one of extreme difficulty, is managed in the simplest manner imaginable. It is the rapid revolution of the globe in the dexterous hands of the workman that does it all: the same law which depresses the poles of the solid earth, and expands her circumference at the equator—the law of centrifugal force—flattens the disc for the glazier, and helps us to cheap glass. The workman carries the globe to the wide mouth of a glowing furnace, where, resting his rod upon a fulcrum, he turns it rapidly round. In a few moments, the glass, yielding to the intense heat, begins to change its form, the small orifice in the centre of the globe expanding momentarily; and now the globe is changed into a deep vessel—now it is a large vase—now a huge saucer—now a shallow dish—and now it is the flat circular table, which as it is drawn gradually from the fire hardens into consistency, and is carried to a flat bed of sand, where it is summarily detached from the rod of the "bull's eye" in the centre. It is now lifted by means of a long fork, and carried immediately to the annealing furnace, where it cools by slow degrees, without which precaution it would be too brittle for use.

The whole of the various processes above described are carried on with such marvellous rapidity and certainty, that a spectator had need make good use of his eyes to understand what is going on. The description we have attempted to

give would probably take as much time to read as would be consumed in the several operations. The crown glass, having remained a sufficient time in the annealing oven, is removed to the cutting-room, where it is cut by the diamond into semi-circles of unequal dimensions, and packed for purposes of commerce.

We are now conducted to another department of the works, where the manufacture of sheet glass by the French process is carried on. Before we describe the process, it will be as well to allude briefly to its history, its adoption by the Messrs. Chance, and the perfection to which they have carried it out in their establishment. It will be obvious to every one that there are two very serious defects in the results of the crown glass manufacture above described; these are the circular shape of the glass "table," which necessitates loss in the cutting up into squares, and the presence of the "bull's eye" in the centre, entailing further loss, or the tolerance of an unsightly nuisance; besides these, there is the further disadvantage of limited size, as no very large square of glass can be cut from the half circle. More than twenty years ago, Messrs. Chance and Hartley visited the glass works of M. Bontemps, near Paris, and witnessed a process of manufacture by which the whole weight of metal, manageable by a single workman, was formed into a sheet of glass, square in shape, and without the knot in the centre. Impressed with these evident advantages, they resolved to attempt the same mode of operation. With this view they secured the co-operation of M. Bontemps, and began their experiments in the latter part of 1832. They had, however, many difficulties to contend with; and among the rest, a duty of 300 per cent. upon the cost of the material. In 1836, Mr. Hartley withdrew from the firm, which has since consisted of Messrs. Chance Brothers, and Co. By 1838 the difficulties of the manufacture appear to have been surmounted, a substantial and serviceable kind of glass from these works being then produced. From that time to the present, improvements have been continually effected; the manufacture of sheet glass has been taken up by other houses, and since the abolition of the excise duty, has increased to such an extent, that it is a question at this moment, whether the weight of sheet glass annually made is not greater than that made by the old process. In the year 1840, the Messrs. Chance introduced, under the name of patent plate, a new variety of window-glass; it is made from an improved sheet glass, ground and polished by a new process, the invention of Mr. James Chance; the surface of this glass is, with very trifling exceptions, perfectly true, while in colour and brilliancy it is not surpassed by the best cast plate. As might be expected, the demand for it is large and continuous, and we have heard it said, that extensive as are the factories of this firm, were they twice as large they might be fully employed. In the new villas and suburban residences everywhere rising in the neighbourhood of London, we recognise this patent plate glass, which passes for cast plate, and can only be distinguished from it by a close scrutiny. Let us glance now at the mode of its manufacture.

The molten glass, at apparently the same con-

sistency as that used for the circular "tables," is gathered by the workman at the end of his tube in the way already described. When he has gathered sufficient for his purpose, however, instead of moulding it to a convenient shape on a flat iron slab, he makes use of a bed of sand and water, as more suitable for his purpose. The glass which he is thus moulding is almost at a white heat, and, *because it is so hot*, it neither cracks nor hisses upon contact with moisture; were it some hundred degrees cooler it would fly into a thousand fragments, perhaps to the fatal injury of the busy operatives around him. This species of work is plainly more laborious than that of the crown-glass maker. The men appear to have heavier masses of the fiery metal to deal with, and to exercise more strength in their management. The mass of metal at the end of the tube, instead of being blown into a globe, has to be drawn out by means of inflation by the breath, whirling aloft and swinging in a cavity in the ground, into the form of a cylinder some four feet in length and near a foot in diameter. The skill of the artificer of course consists in his ability to do this in such a manner that there shall be an equal thickness of glass on every square inch of the long cylinder. He presents a very curious spectacle to a stranger while thus occupied. Standing at the mouth of a glowing furnace, and upon the edge of a deep pit in the floor, he now blows into the revolving tube, now brandishes it aloft, grimly watching it the while, as though he were going to balance it on his chin, now pokes it into the fire, withdraws it again and dangles it in the pit, then whirls it round half-a-dozen times in the air. Thus tormented, the mass grows longer and bigger and more and more transparent, until, at length, having been tossed and whirled, and roasted and toasted, and blown and balanced, and dangled into the precise shape and substance upon which the workman had set his mind, it is allowed to cool, and is deposited upon a tressel standing a few yards from the furnace. The pyramidal end next the blow-pipe has now to be cut off; this is done by a lad, who twists a snaky ribbon of the glowing metal from the furnace round that part of the cylinder which he wishes to detach, and then touches the spot with a little cold water. The cylinder, now about forty-five or fifty inches in length, is first allowed to cool; a lad then pokes with one end of it a straight-edge and a crooked instrument armed with a diamond, and with a stroke slits it from end to end. The cylinder has now to be changed into a flat plate. For this purpose, it is carried to another furnace, in an oven at one side of which it is gradually re-heated. When it has acquired the right temperature, it is removed to a flat smooth slab in the centre of the fire, where, by the action of intense heat, it soon shows symptoms of melting. It is laid on the slab with the slit uppermost: as the glass softens in the fire, the workman, with his long iron rod, carefully turns back the overlapping sides, and lays the sheet flat on the stone; he now changes his rod for a long hoe-shaped instrument, with which he in a manner kneads it to a perfect level. This accomplished, the slab, which runs upon a tramway at the bottom of the furnace, is drawn away in the rear, and the glass, becoming in a few moments sufficiently hard to be

removed, is stacked up in the annealing oven, after which it is ready for the purposes of the glazier. It was with glass thus made, weighing sixteen ounces to the square foot, and measuring forty-nine inches each pane, that the Crystal Palace was glazed.

But supposing that the sheet of glass, whose fiery birth we have thus described, is intended to be patent plate, it has yet further and more protracted processes to undergo. To witness these, we must quit this part of Chancetown, as it ought to be called, and, descending a hill and crossing a bridge, make our way to a different part of the works, where the grinding and polishing and the artistic ornamentation of glass are carried on upon a most extensive scale. To become "patent plate," the sheets of glass, supposing them to be of the proper quality and thickness, have to be ground and polished. The grinding is performed in an immense apartment, some considerable proportion of an acre in extent, upon approaching which the ear is saluted by such a strange and portentous combination of sounds as cannot be heard elsewhere, and which we can compare to nothing but an imaginary tempest in a sea, the billows of which should be crags of rock and blocks of timber instead of salt sea-waves. The spectacle within is very much in keeping with the unearthly din. The whole floor is one congeries of heavy machinery in violent agitation, under the impetus of steam-power. Hundreds of sheets of glass, pressed beneath weighty slabs, are grinding one another's faces with sand and water. In order to insure an equal friction upon every portion of the surfaces, a strange eccentric motion is imparted to the beds between which they are packed, which gives them the air of creatures struggling to get free from a position in which they are anything but comfortable. We know not how long this ceremony of grinding endures; but when the plates are relieved they are turned over to gentler treatment, which they receive in another large apartment, at the hands of young girls, whose duty it is to examine each plate, and to finish by hand those few portions of its surface left untouched or imperfectly ground by the machines. A sheet of glass thus ground is a most beautiful object, and a market might be found, and most probably is found, for a considerable quantity in that state. By far the greater portion, however, has to undergo the final process of polishing, which takes place in another enormous room, fitted up with machines in all respects, so far as we could observe, similar to those in the grinding-room, with the exception that the slabs are covered with felt or leather rubbers, and fed with red oxide of iron instead of sand and water. The polish imparted by this means is considered equal to any that can be attained. The whole of these machines, as well for polishing as grinding, are driven by an enormous steam-engine, suckled by five boilers, each of which would serve for a palace for an Irish family. The engine lives in three floors at once, and we had to climb two flights of stairs to get, by instalments, a view of his entire proportions.

The ornamental department of this establishment is situated in the neighbourhood of the grinding and polishing rooms. We can enter less into detail on this subject, for reasons which the

reader will naturally conceive, the processes of painting and staining glass being but partially intelligible by a casual visitor, even when he is allowed to witness them, which is not always the case. Among the many beautiful specimens we saw were some capital imitations of the old mediæval church windows. There is, it is said, a considerable demand for these at the present time; but it strikes us as absurd, that the artists who produce them should be bound down to copy the defects and deficiencies of the old style as well as its merits. So it is, however; and it appears to be the rule, that whenever a coloured window is erected in a church or chapel, the outline of the design must needs be traced by an ungraceful line of dark lead, a resource to which the old artists were driven by want of better materials to work with—a want which no longer exists. Designs purely artistic are here in course of execution.

We had the pleasure of seeing several finished portions of a transparent ceiling, intended for Chatsworth house, which will consist of a series of paintings from allegorical designs of a high order of merit, by a French artist. We saw enough of these performances to assure us that all that is wanting to complete success in the art of painting on glass, in our own country, is that its practice should be taken up by men capable of drawing with fidelity and breadth, and well versed in the difficult science of colour. Even an artist, however, thus qualified would have to revise all his previous knowledge and experience, inasmuch as the colours used in glass-painting assume new tints under the action of the heat of the kiln, to which the pictures must be subjected. The expense of getting up these pictures must be very great, partly from the slow and laborious nature of the process, and partly from the risk of breakage, which may destroy the work of months in an instant.

A plainer variety of ornamentation, for domestic and decorative purposes, is also here carried out to a great extent by means comparatively simple. The sheet of glass upon which the designs are to be impressed is brushed over with a whitish vitreous mixture, so combined as to melt at a certain temperature which would not affect the glass. When this is dry, it presents a surface sufficiently hard for the pencil of the artist, who, first drawing his design upon it, then easily scrapes away with the graving tool such portions of the cloudy surface as he wishes to remove. The drawings being finished, the sheets or plates of glass are carried to the kiln, the heat of which unites the whole in one mass, without injuring the design, which glimmers in clear crystal forms upon a kind of frosted ground. At the time of our visit, several young artists were employed in transferring designs upon sheets of glass thus prepared. But we witnessed a more remarkable adaptation of the same process in a room below. Here stood what appeared at first sight a strange, nondescript, and complicated engine, but which proved to be a kind of engraving-machine, combining, as it appeared to us, the properties of the lathe and the pentagraph. It was manufactured by the late Mr. Holtzapfell, of Long Acre, whose extraordinary mechanical talent was well known throughout the country; and it is questionable whether, since his death, any one could be found to produce its fellow.

It does its work in the following manner: the sheet of glass to be ornamented is laid upon a flat slab, the cloudy surface uppermost; the slab being adjusted in its proper position, under the graving tool, the operator has nothing to do but to turn a handle, and in a very few minutes an exquisite pattern is engraved in the centre of the glass. The patterns thus produced appear not to be limited to any particular species of lines or curves, the tool working rapidly in all directions—waving, circular, curvilinear, angular, or in straight lines, and occasionally with a rapidity which the eye cannot follow. By this masterly contrivance an immense saving of time is effected—the work of a day under the pencil of an artist being done, with a precision which an artist could hardly accomplish, in a few minutes.

We are at the verge of our narrow limits, and must refrain from remarking on various other ornamental processes, which had their origin at Spon-house, and upon the experiments still carrying on having for their object the introduction of real art into the operations of manufacture. We have probably omitted all mention of many of the products of this vast factory, but we make no pretensions even to a knowledge of the whole of them, and our restricted space will not allow us to add much to what is already written. One thing, however, we cannot suffer to pass unrecorded, and that is, the humane and truly philanthropic spirit of the proprietors, which has led them to provide for the education of the children of their workmen, who are educated under their superintendence, at a cost little more than nominal to the parents. The schools and buildings necessary for this purpose were erected at an expense of several thousand pounds, defrayed by the Messrs. Chance; and hundreds of the children are there educated under the charge of qualified tutors, the books, papers, etc. being provided by the proprietors.

### THE BLOOD PARASITE.

It is well ascertained that the peculiar colours exhibited by lakes and other pieces of water, under certain conditions, are in general due to the presence of minute vegetable and sometimes animal productions. Such simple organisms as the lowest tribes of freshwater algæ, which represent the zero of vegetable life, are found in every situation suitable for their development; even the rain and the dust of the atmosphere are thickly impregnated with such microscopic beings. One of these minute productions—*Protococcus nivalis*—is developed in the snow of northern regions, to which it communicates the colour of blood, and is hence called "red" or "bloody snow." This simple plant, consisting only of a single cell, which propagates itself by division into a number of separate cells, has been long known by botanists; but another production allied to it, or at least presenting a resemblance in general appearance, and certainly not less remarkable, has just been brought into notice by M. Montagne, in a paper published in the "Comptes Rendus," (xxxv. p. 145), and the "Annals of Natural History" for October, 1852.

M. Montagne observes:—"An extraordinary phenomenon has just passed under my eyes, to



which I beg to call the attention of the academy for a moment. I had already some knowledge of it from two Memoirs which have treated of it specially, but had never witnessed it previously. Moreover, this phenomenon is so rare, that I am not aware of its having ever been mentioned in this country. I am speaking of the development of a parasite, either animal or vegetable, which, under certain circumstances, attacks alimentary substances, especially pastry, communicating to them a bright red colour, resembling that of arterial blood. According to the interpretation of several historical facts given by M. Ehrenberg, who has published a very interesting and erudite work upon this production, its appearance in the dark ages must have given rise to fatal errors, by causing the condemnation of unhappy victims to capital punishments for crimes of which they were totally innocent. It is, in fact, to this phenomenon that we must refer all those instances of blood found in bread, on consecrated wafers, etc. which the credulity of our fathers attributed to witchcraft, or regarded as prodigies of fatal presage."

M. Montagne happened to be with M. Ang. Le Prévost at the Château du Parquet in July, 1852, when the temperature had been exceedingly high for about ten successive days. It was there that the curious production was observed, and, no doubt, the continued warmth of the atmosphere was instrumental in providing the conditions suitable for its development. "The servants, much astonished at what they saw, brought us half a fowl roasted the previous evening, which was literally covered with a gelatinous layer of a very intense carmine red, and only of a bright rose colour where the layer was thinner. A cut melon also presented some traces of it. Some cooked cauliflower which had been thrown away, and which I did not see, also, according to the people of the house, presented the same appearance. Lastly, three days afterwards, the leg of a fowl was also attacked by the same production."

From a microscopic examination M. Montagne concluded it to be the same thing which had been observed by M. Ehrenberg, viz. a minute animalcule, bearing the scientific title of *Monas prodigiosa*. This was confirmed by a specimen from Dr. Rayer, which had been developed upon cooked rice, and submitted by that gentleman to M. Montagne's examination some years ago. The individuals which compose the substance are so exceedingly small as to require a magnifying power of 800 diameters to see them satisfactorily. Their diameter was measured at one-seven-hundredth of a millimeter!

M. Montagne mentions, that the "parasite" is propagated with great facility, when sown under favourable conditions, in cooked rice for example, placed between two plates, or in closed vessels. M. Sette does not agree in the opinion of it being an animalcule, but rather regards it as a fungus—*Zoogalactina imetropa*.

This production, though so very minute, is not entirely without its economical uses. An ingenious chemist of Padua, M. P. Col, has been successful in the application of it to the tinging of silk in various shades of rose colour, the tint being very delicate.

### LIFE IN AN HOSPITAL.

READER, were you ever in an hospital ward? If not, imagine to yourself a long and lofty room with little iron bedsteads at short intervals down each of its sides, and let the time be early morning, the grey dawn struggling in at the windows, and all silent save the heavy breathing of a patient here and there, and the occasional pacing of the "night nurse," who is already beginning to put the ward into its day attire. Even that deep sufferer near the entrance has sunk into a troubled slumber, after tossing on his narrow bed until the day had almost begun to render his pallid features visible. It is now time to rise, and the stillness is changed into a busy scene; some are rising, and others, unable to do so, are fitting themselves in bed for that light which reveals dirt and litter, which are held in especial abomination in an hospital. Breakfast is over, and the ward is rapidly assuming an air of neatness and cleanliness; the "night nurse" and the "day nurse" are both bustling about, and the "sister," who superintends all and lives in apartments adjoining the ward, is serving the medicines, eyeing every thing, and giving orders, rebuke, or encouragement as occasion requires. Let us now become acquainted with some of the sufferers.

Number One (for the patients are known by the number of their beds) is an Irish boy, ignorant, generous and ragged, full of fun and mischief; and as his broken leg is nearly well, he is now able to indulge his fondness for tricks of all kinds, to the amusement of some, and the annoyance of others of his "mates," as he terms them. Number Four, pale, haggard, and wasted away: death is stamping his seal, and shortly will claim him for his own. Seven, a character, a man who has been everywhere and seen everything, and who will assuredly die in an hospital or a workhouse: a drunkard, a frequenter of theatres, debating clubs, races, and such places; he has been apprentice, clerk in a ship, lawyer's clerk, waiter at an inn, man of all work, and will end by being a pauper. Eleven; who is he with handsome countenance, that bears evident tokens of having been accustomed to different society from that in which he now is? Ah! a sad story: dissipation has brought on disease, and his pious parents have now to mourn over an only son, sinking into an early grave. Fourteen: a painful case, offensive to the senses; and alas! affliction seems to have done the patient little good, for he is irritable and bad tempered, and his language is at times shocking. Number Seventeen: a young man of good abilities, which have been cultivated expensively, as his widowed mother can tell, the victim of a distressing disease of the eyes; but happily, most happily, that mother's prayers and teachings seem at last to have been rewarded, for the bible is the dearest of all books to that cultivated understanding.

And now, having introduced our readers to some of the patients, let us spend the rest of the day in the ward. Some are now reading, some talking, some sleeping; poor number Four is occasionally heaving a groan and turning from side to side, the chaplain having left him a short time ago; the boys are as busy as can be, drawing on slates, looking at picture-books, playing with toys, or chatting to one another; and one little fellow, rag-

ged, but with an intelligent face, is seated on Seventeen's bed, spelling his way through a chapter in the bible. The steward has now been round on his tour of inspection; the sister has told him the funny sayings of the Irish boy; the "dressers"—medical students—have attended to the minor operations of the ward; and at this moment the sister is putting on a smart new cap, for to-day is "doctor's day" and he is expected shortly. Presently he enters, with a troop of students at his heels, and as he walks from bed to bed an occasional scream or groan gives token that he is busy in his painful but salutary work, whilst the students crowd around, except that group of three, who are chatting about the forthcoming races at Epsom.

It is all over now; dinner is past, and soon it will be time to admit the friends of the patients; Six is inquiring what o'clock it is, for he expects to see his wife to-day, and Fifteen is listening for the reply, for he, poor little fellow, is hoping to see his mother, who, not having seen him since yesterday, seems to him to have been an age away. And now the clock has struck, and some faces are already brightened by the arrival of friends; a still and sorrowful female is seated at Four's bedside; and here a mother and her child are coming down the ward, with eager and anxious looks, to number Nine, who was carried in only an hour ago, having fallen from a scaffold; Six has just given his wife a kiss, which sounded all over the ward; and a merry group is collected round Eighteen, who is nearly well. The time for visitors has now passed rapidly to those who have had friends to see them; slowly, to those who have not; and poor little Fifteen is in tears because his mother has not been; Six is bidding his wife good-bye, who has already given him two farewell kisses, and is now giving him a third: and now all are gone.

Tea is over, the time for prayers is come, and the voice of the reader is sounding aloud these beautiful words: "Finally, we commend to thy fatherly goodness all those who are any ways afflicted or distressed, in mind, body, or estate, (especially those here present,) that it may please thee to comfort and relieve them according to their several necessities, giving them patience under their sufferings, and a happy issue out of all their afflictions." The sister has gone out for an evening walk, and now the time for a little uproar has begun. Little fellows ordered to keep their beds are skipping vigorously about; three or four are collected round that bed in the corner, listening to and telling marvellous stories about golden treasures, robbers, and other such things as excite boyish imaginations, and one or two of the older patients are indulging themselves with a song. Nurse occasionally scolds and threatens, but evidently enjoys herself the brief freedom from restraint.

Bedtime has now arrived; those who are up, retire; the resident physician and the house-surgeon have been their rounds; the night nurse has returned; and in a few hours all is still save the moaning of number Four, who seems restless and uneasy. It is now midnight; "night nurse" has dropped off into a comfortable but forbidden doze, when suddenly she is awoken by Five, who calls out that Four is worse. Sister is called; one of the medical men attached to the hospital is sent for, but too late, for after a few deep gasps the spirit leaves the wasted form, and

the light of the candle with its feeble glare in the spacious ward only reveals and increases the ghastliness of the corpse. A sudden call, and alas! it is to be feared that he was unprepared for it. Happily Three sleeps so soundly that he is undisturbed by the noise; and Five, though feeling a little uncomfortable at the thought of having a dead body so near him, falls asleep in time, and all is still again. In a few hours, the body having been attended to, a coffin-like box will be brought, the corpse slipped into it and hurried off.

Such is hospital life. Variations of course occur; the *authorities* vary their times of coming, or stay away altogether sometimes; and death only makes *his* visits occasionally, though seldom absent for many weeks. Hospitals are magnificent institutions, and are in many respects admirably conducted, and could women of piety be secured as sisters—and is it too much to hope for pious nurses too?—and an adequate spiritual supervision provided for from ministers, scripture readers or others, they would be much better. May those who have influence in such matters see to them, for at present, though the ward of an hospital is a place where the body may be healed, it is often one where the soul is deeply tainted with that disease which is far more to be dreaded than any bodily ailment, however distressing.

#### THE SPIDER-CATCHING FLY OF VAN DIEMEN'S LAND.

THIS insect is about the size and figure of a wasp, but in colour resembling the domestic fly. Its habits are very singular. The spiders it captures with so much daring, are not intended for food for itself, but for its future progeny. The fly in the height of the summer season may be seen very busy on the moist banks of the river, collecting mud to form cells, which it constructs with great expedition. These cells are made to contain three or four spiders, most of them half as large as itself, which are closely packed, and immediately covered over, the cover of the first being the basis of the second, and so on in succession. It takes advantage of any chink in the wall, or niche in the angles of the doors or windows for its building purposes. I have not ascertained if the fly hunts singly or in couples, but one at least found its way up-stairs, or through the window of a bedroom, and constructed, before it was observed, a number of its clay cells on the chintz bed-curtain. When discovered, and the cells brushed down, the spiders covered the bottom of a dessert plate, and presented a beautiful appearance, being of all colours, and some as if richly enamelled, and quite perfect and as fresh as if alive, though evidently quite dead, for none of them revived on exposure to the air. This was the work of two or three days only. The spiders were all of the geometrical class, and were killed as soon as seized. On another occasion we found an Italian iron filled up by them, as also an iron saucepan handle, and a dress that had been suspended on a nail, for a few days, had a large patch of their nests upon it. So soon as the cavity is filled up with fine plump spiders, an egg is deposited therein, and when duly hatched the grub has a sumptuous feast prepared.